XRG TECHNOLOGIES™

To be the **premier engineering** partner in the journey to a **cleaner** and more **efficient** world.

XRG Technologies is an innovative engineering and procurement firm focused on fired and unfired heat transfer equipment for the refining, petrochemical, and power markets.

We collaborate with our partners to solve complex problems and manage projects from concept to completion. We have brought together a team of fired heater, burner, boiler, flare, and thermal oxidizer experts to create one centralized, go-to engineering firm for all your process equipment needs.

NEW TECHNOLOGIES

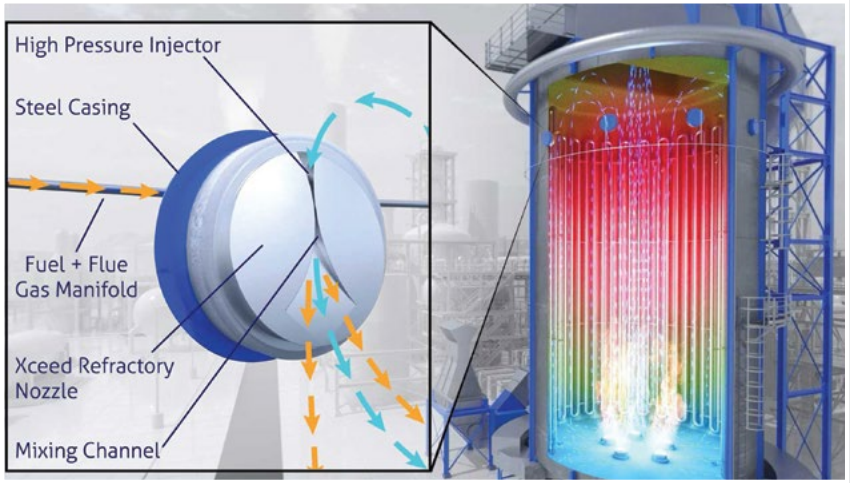
Xceed™ System

The Xceed system works with new or existing burners by redirecting a portion of the fuel to the specialized nozzles. The nozzles disperse combustion to:

- increase temperature uniformity
- remove hot spots
- increase capacity and radiant thermal efficiency
- extend run lengths
- reduce NOx to SCR levels
- enable up to 100% CO2 reduction

The Xceed technology is fuel agnostic, is compatible with existing safety standards like EN 746-2 and CSA, requires few changes to the existing fuel supply system, and is simple to operate.

The flexible Xceed system can be easily retrofitted to existing heaters and allows for operation with zero to 100% dispersed combustion.



Electric Process Heating

XRG has developed several concepts for fully electric and hybrid process heaters with systems that can be retrofitted onto existing equipment.

Electrification allows for a reduction in firing rate which enables reduced CO2 from fired equipment. By combining in-depth process knowledge and the understanding of how to properly distribute heat into the system, XRG can optimize your process heating equipment while helping you achieve your climate goals.

XRG SERVICES AND SOLUTIONS

CONSULTING, TROUBLESHOOTING, & ENGINEERING STUDIES

- Site surveys
- Detailed thermal and hydraulic analysis
- Computational Fluid Dynamics (CFD) modeling
- Finite Element Analysis (FEA)
- Solutions development
- Cost benefit analysis
- Environmental permitting assistance

EQUIPMENT SUPPLY AND REVAMPS

- Detailed process design
- Data sheet development
- Structural & mechanical engineering
- Piping stress analysis
- General arrangement & detailed drawings
- Technical & commercial evaluations
- Procurement/Fabrication
- Project management
- Quality control & inspection

ON-SITE SUPPORT

- Installation & field erection
- Heater/burner re-rating services
- HAZOP & safety studies
- Inspections
- Training
- Installation supervision
- Start-up & commissioning

NEW EQUIPMENT

We know the importance of capital investments, so we help teams quantify and understand the options. Our team will develop the most cost-effective solutions to meet your end goals, without sacrificing performance or reliability. XRG adds value by bringing a thorough understanding of new technologies which enables us to develop innovative solutions that other companies cannot. XRG guarantees superior performance and reliability by utilizing our proprietary software tools, as well as programs like FRNC-5PC, CFD and FEA.

Our design capabilities include fired, electric, and hybrid process heaters, and specialized related equipment.

Field Installation vs XRG's 3D Model

REVAMPS

Revamping is a cost-effective way to improve the utilization and reliability of existing assets. XRG provides in-depth evaluations of technology options and project scenarios to deliver the most economical revamps.

BENEFITS INCLUDE:

- Increased thermal efficiency
- Conversion to hybrid/electric
- Capacity increases
- Emissions reductions
- Fuel flexibility
- Improved safety and reliability
- Extended heater life
- Improved run-length

SERVICES INCLUDE:

- 3D Scanning of existing equipment to ensure precise fit-up
- Evaluation and implementation of emissions reduction options (burners, Xceed™, SCR, SNCR, and alternative technologies)
- Furnace component mechanical reliability analysis
- Capacity expansion feasibility and implementation
- Short run-length and flame impingement root cause analysis
- Efficiency improvements through the application of new technologies, addition of air preheater, flux profile enhancements, extended surface areas, modified/redesigned convection sections, restoration of furnace lining, etc.
- Optimizing decoke procedures for effectiveness and efficiency
- Optimizing decoke piping and effluent injection into the firebox
- Improving air distribution in balanced and forced draft systems

Field Installation vs XRG's 3D Model

ENGINEERING STUDIES

XRG specializes in analyzing and suggesting performance improvement opportunities, focusing heavily on eliminating bottlenecks, reducing emissions, and improving mechanical reliability.

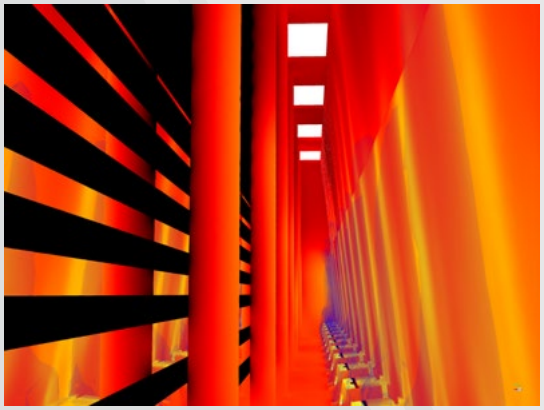
Site Surveys allow us to build models for evaluation using instruments like emissions analyzers, infra-red (IR) cameras, and pyrometers to determine temperatures, pressure profiles, and flue gas constituents.

Advanced Analytics & Modeling tools allow XRG engineers to troubleshoot problems, conduct feasibility studies, provide cost-benefit analyses, and perform thermal ratings. Our in-house CFD and FEA modeling allows us to locate inefficiencies in a system, identify root causes, and develop cost effective solutions that are unsurpassed in the industry. A typical study may include:

- Evaluation of combustion equipment design
- Identification of system bottlenecks
- Material suitability analysis
- Assessment of flame quality issues
- Thermal and hydraulic ratings
- Vibration root cause analysis
- Development of emissions reduction options

Recommendations are developed from the analysis and modeling to provide actionable options for achieving your desired outcomes.

Implementation strategies can be provided which build on our rigorous studies to deliver turnkey solutions.



CFD simulation of a coker heater from the sight port location

Combining diverse expertise with advanced simulation tools, we develop innovative combustion and heat transfer solutions that enable the industry to achieve its energy efficiency and environmental stewardship goals.

1855 E 15TH STREET | TULSA, OKLAHOMA 74104
+1 918 201 2656 | info@xrgtechnologies.com

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